

CLAIMS

What is claimed is:

1. A method of removing a mold from a casting formed therein, comprising:
directing an energized stream at the mold to cause the mold to degrade;

and

dislodging at least a portion of the degraded mold from the casting.

2. The method of claim 1, further comprising scoring the mold by forming score lines in exterior walls of the mold.
3. The method of claim 2, wherein the score lines are placed in predetermined locations for breaking down and dislodging portions of the mold from the casting.
4. The method of claim 1, further comprising thermally expanding the casting to cause the casting to bear against the mold.
5. The method of claim 4, wherein the casting is expanded by heating the casting.
6. The method of claim 5, wherein the casting is heated by an energy source selected from the group consisting of radiant energy, inductive energy and combinations thereof.

7. The method of claim 6, wherein the energy source is selected from the group consisting of electromagnetic energy, lasers, radio waves, microwaves, and combinations thereof.
8. The method of claim 1, and wherein the mold is formed from sand and a degradable binder that is combusted as the mold is heated under elevated pressures in an enriched oxygen atmosphere to facilitate breakdown of the mold.
9. The method of claim 1, wherein at least a portion of the degraded mold is dislodged from the casting prior to heat treating the casting.
10. The method of claim 1, wherein the energized stream comprises a pressurized fluid.
11. The method of claim 10, wherein the pressurized fluid comprises heated air, thermal oils or water.
12. A method of dislodging a mold from a casting formed therein, comprising:
 - directing an energized stream at the mold, wherein the energized stream comprises an explosive charge detonated at a selected location within exterior walls of the mold; and
 - dislodging at least a portion of the mold from the casting.

13. The method of claim 12, wherein the mold is comprised of sand and a binder.
14. The method of claim 12, and further including scoring the mold by forming score lines in exterior walls of the mold.
15. The method of claim 14, wherein the score lines are operatively placed in combination with the explosive charge in predetermined locations for breaking down and dislodging portions of the mold from the casting.
16. The method of claim 12, wherein at least a portion of the mold is dislodged from the casting prior to heat treating the casting.
17. The method of claim 12, wherein dislodging the pieces of the mold comprises heating the casting to cause expansion of the casting.
18. The method of claim 17, wherein heating the casting comprises applying energy to the casting from an energy source selected from the group consisting of radiant energy, inductive energy and combinations thereof.
19. The method of claim 18, wherein the energy source is selected from the group consisting of electromagnetic energy, lasers, radio waves, microwaves, and combinations thereof.

20. The method of claim 12, and wherein the mold is formed from sand and a degradable binder that is combusted as and the mold is heated under elevated pressures in an enriched oxygen atmosphere to facilitate breakdown and dislodging of the mold from the casting.

21. The method of claim 12, and wherein directing an energized stream at the mold further includes directing a pressurized fluid at exterior walls of the mold.

22. The method of claim 21, wherein the pressurized fluid comprises heated air, thermal oils or water.

23. A method of dislodging a mold from a casting formed therein, comprising:

stimulating the mold with an energy pulsation;

fracturing the mold; and

dislodging the mold from the casting.

24. The method of claim 23, wherein the energy pulsation is applied as a shock wave.

25. The method of claim 23, wherein the shock wave is produced from at least one of the following: mechanical means, cannons, pressurized gasses and electromechanical means, and a combination thereof.

26. The method of claim 23, and further comprising scoring the mold by forming score lines in exterior walls of the mold.

27. The method of claim 26, wherein the score lines are operatively placed in predetermined locations for breaking down and dislodging portions of the mold from the casting.

28. The method of claim 23, wherein pieces of the mold are dislodged from the casting prior to heat treating the casting.

29. The method of claim 23, wherein dislodging the mold from the casting includes heating the casting so as to cause the casting to expand.

30. The method of claim 29, wherein heating the casting comprises applying energy to the coating from an energy source selected from the group consisting of radiant energy, inductive energy and combinations thereof.

31. The method of claim 30, wherein the energy source is selected from the group consisting of electromagnetic energy, lasers, radio waves, microwaves, and combinations thereof.

32. The method of claim 23, and wherein the mold is formed from sand and a degradable binder and dislodging the mold from the casting comprises combusting the

binder as the mold is heated under elevated pressures in an enriched oxygen atmosphere to facilitate breakdown of the mold.

33. The method of claim 23, wherein stimulating the casting with a high energy pulsation includes directing a pressurized fluid at exterior walls of the mold with a force sufficient to cause the mold to fracture.

34. The method of claim 33, wherein the pressurized fluid comprises heated air, thermal oils or water.

35. A method of dislodging a mold from a casting formed therein, comprising:

moving the mold along a processing path with the casting therein;
directing a fluid media at exterior walls of the mold; and
dislodging the mold from the casting with the fluid;

36. The method of claim 35, wherein the fluid comprises heated air, thermal oils or water.

37. The method of claim 35, wherein dislodging the pieces of the mold comprises heating the casting to cause expansion of the casting within the mold.

38. The method of claim 37, wherein heating the casting comprises directing energy through the mold at the casting with an energy source selected from the group consisting of radiant energy, inductive energy and combinations thereof.

39. The method of claim 38, wherein the energy source is selected from the group consisting of electromagnetic energy, lasers, radio waves, microwaves, and combinations thereof.

40. The method of claim 35, and wherein the mold is formed from sand and a degradable binder, and dislodging pieces of the mold from the casting includes combusting the binder of the mold as the mold is heated under elevated pressures in an enriched oxygen atmosphere to facilitate breakdown of the mold.

41. The method of claim 35, wherein the pieces of the mold are dislodged from the casting prior to heat treating the casting.

42. The method of claim 35, wherein dislodging the core from the casting comprises removing at least a portion of the core from the casting.

43. The method of claim 35, wherein the fluid media is directed at the exterior walls of the mold when the casting is partially solidified.

44. A method of removing a mold from a casting formed therein, comprising:

directing an energized stream at the mold when the casting is partially solidified; and,

dislodging at least a portion of the mold from the casting.

45. The method of claim 44, wherein the energized stream includes at least one stream selected from pressurized fluids, explosives, electromagnetic energy, particles and combinations thereof.

46. The method of claim 44, further comprising scoring the mold to weaken the mold.

47. The method of claim 44, further comprising heating the casting to cause thermal expansion of the casting.

48. The method of claim 44, wherein dislodging at least a portion of the mold includes removing at least a portion of a core from the casting.